



Collaborative pedagogy: communication issues and dynamics of co-construction of knowledge

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INTRODUCTION & AIM

The digital society is deeply changing educational practices and posing new challenges to teaching and learning systems. In such a context, teachers and learners need to develop digital skills to adapt to such changes and improve the quality of pedagogical interactions (Redecker & Punie, 2017; OECD, 2016). Such skills include mastery of information and communication technologies (ICT), which are at the heart of communication and transmission of knowledge.

In this regard, many international frameworks have been developed to structure and assess the teachers' digital competences, such as the DigCompEdu framework of the EU (Redecker & Punie, 2017), the ICT framework of UNESCO (UNESCO, 2011), and the recommendations of the OECD and the EU on key competences for lifelong learning (Council of the European Union, 2018; OECD, 2018). Frameworks emphasize the need of integrating ICT to support innovative pedagogical practices for the requirements of the 21st century.

Furthermore, the study shows that online and hybrid teaching today is an important lever to increase the effectiveness of learning (Means et al., 2013). Moreover, the use of technology helps communication between the various educational stakeholders, especially teachers, learners and parents (Hornby, 2011). In this context, the development of teachers' digital skills is a necessary condition to respond to the changes in contemporary education (Gaudiaut, 2024; Berg & Seeber, 2016).

The aim of this study is to analyze the frequency of use of information and communication technologies (ICT) by science teachers in the Marrakech-Safi region, and to study their role in improving communication between teachers and learners, between teachers and parents and among the teachers themselves.



METHOD

Study design

The current study is of descriptive quantitative type and aims to analyze the use of ICT and the quality of pedagogical interactions of physical-chemistry teachers in the Marrakech-Safi region.

Sample and population

The target population is made up of physical chemistry teachers working in the Marrakech-Safi region. The sample was 247 teachers from the public and private sectors. The sample comprises teachers of varying experience levels, genders, and work settings (urban, rural, and peri-urban).

Research tool

Data were collected through a structured questionnaire based on the DigCompEdu framework and adapted to the Moroccan educational context.

The questionnaire contains:

- Sociodemographic data (sex, age, seniority, sector, area of practice)
- Use of ICT in education Frequency of interaction:
 - Teachers' pupils
 - Teachers' parents
 - Teachers' teachers
- Digital skills awareness

We first carried out a pre-experiment (pre-test) to check the clarity and relevance of the items before the final distribution.

Procedure for Data Collection

The data collection was performed from October 1 to November 30, 2025.

The questionnaire was administered to the teachers with the assurance:

informed consent, anonymity and confidentiality of responses.

Analysis of data

The data were processed by descriptive and analytical statistic methods namely:

Frequency and percent Description of the sample characteristics and use of the ICT

Usage level analysis and interactions Methods and standard deviations

Comparative analysis: study of the differences according to some variables (e.g. gender)

SPSS software was used to perform the analyzes.

RESULTS & DISCUSSION

This section presents the results of the analysis of the data collected from the physical-chemistry teachers of the Marrakech-Safi region. The sample was mainly composed of male teachers (72.7%) and most of the teachers were between 21 and 30 years old (68%) and had less than 10 years of professional experience (56%). Most participants worked in the public education sector (80%) and were in urban areas (62%).

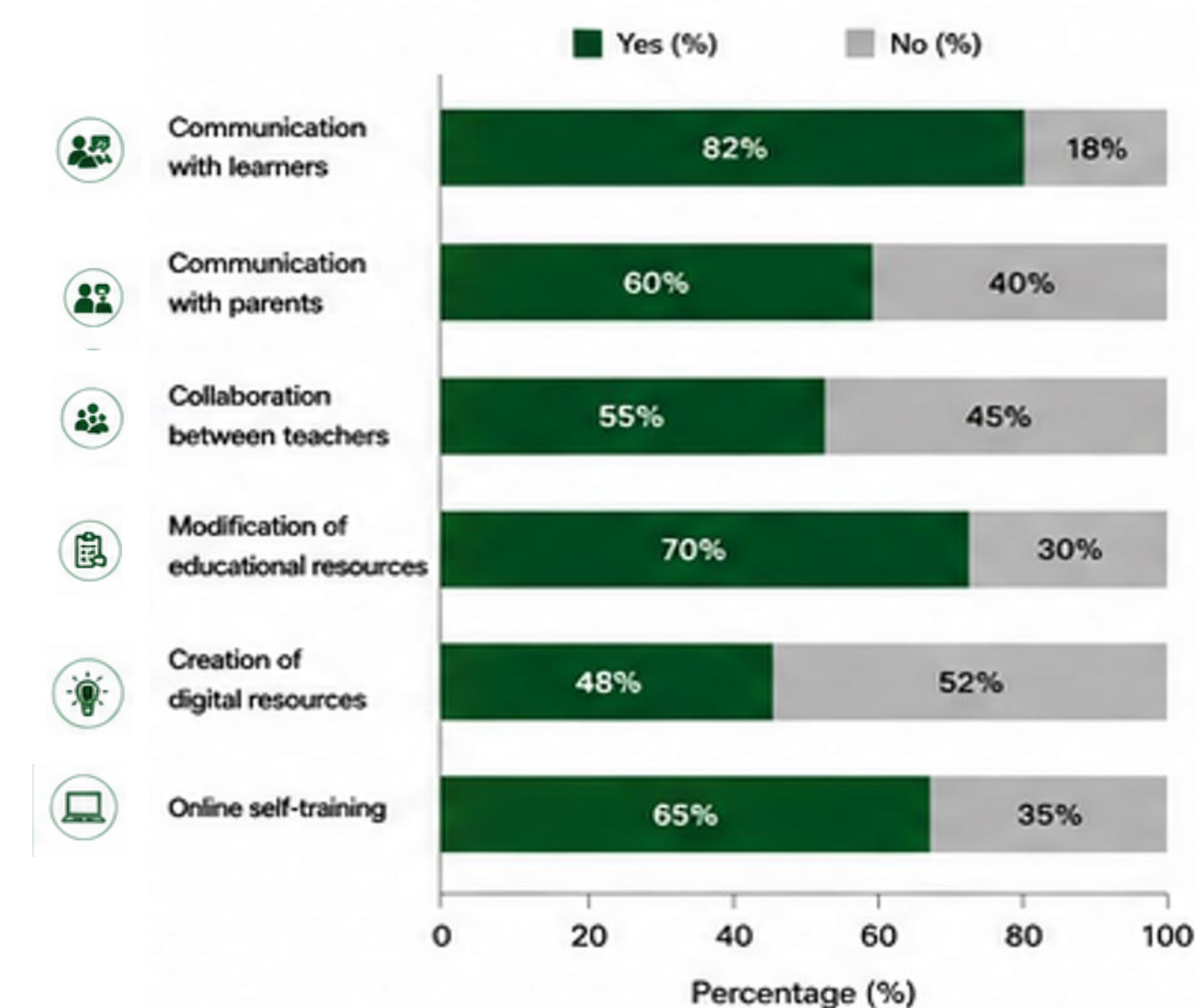


Figure 1. Distribution of responses on the use of digital technology

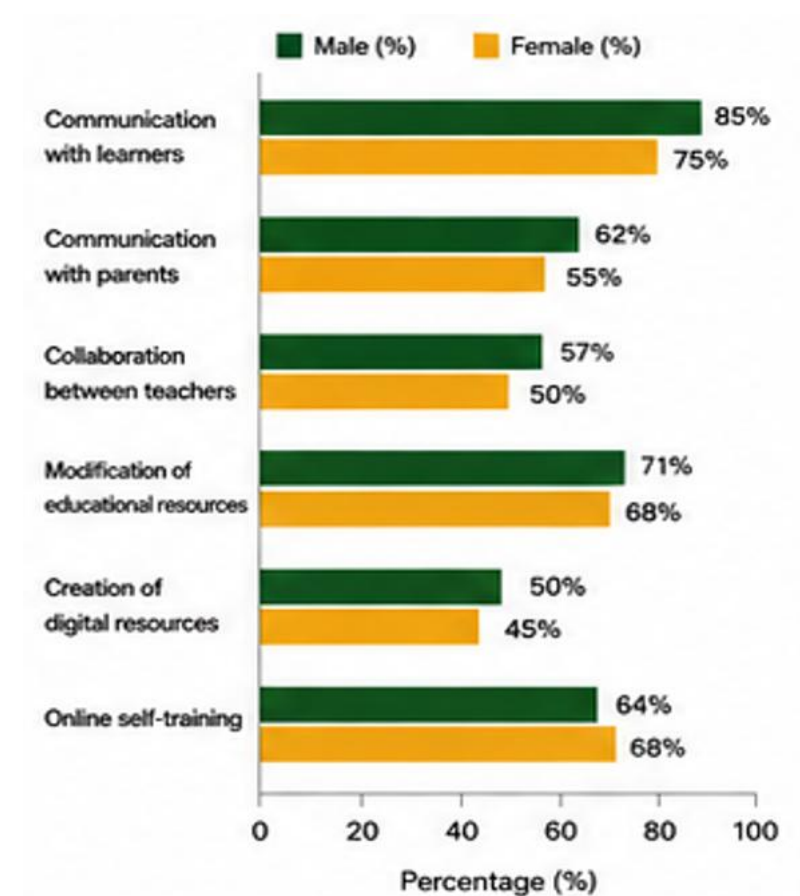


Figure 2. Cross-analysis of digital usage according to gender

Table 1. Average and standard deviations of the studied dimensions

Dimension	Mean	Standard deviation
Communicate with the learners	3,1	1,2
Communicate with parents	2,2	1,0
Collaborate with other educators	2,3	1,1
Modify/develop open resources	1,9	1,0
Create/co-create digital resources	2,6	1,2
Improve digital skills	2,8	1,3

The internal consistency analysis of the questionnaire showed Cronbach's coefficient alpha was 0.80, with standard deviations of less than 2, confirming the reliability and validity of the data collected (Cronbach, 1951). The findings also suggest that the digital interaction between the teachers and learners usually occurs monthly, which can be explained by the complementary use of digital tools in teaching, as pointed out by Means et al. (2013). Teacher collaboration also continues to be monthly, mainly due to the organizational constraints and lack of time described by Berg and Seeber (2016). Finally, the exchanges between teachers and parents seem to be carried out on a half-yearly basis, mainly according to the institutional practices and school culture noted by Hornby (2011).

CONCLUSION

The findings of our study are in line with a number of other research findings on the importance of teacher-learner, teacher-parent interactions and collaboration among educators. Technology is acknowledged universally as a strong lever for improving these interactions and supporting learning (Selwyn, 2012). Our results, when compared with those of Nouri and Andersson (2021) and Epstein and Sheldon (2016), revealed that increasing the frequency of interactions and more intensive use of digital tools could significantly improve student engagement and parental support.

MAIN FINDINGS

Teachers use ICT a lot to communicate and adapt resources but create little original digital content.

COMMUNICATION AND INTERACTIONS

Basic digital skills exist, but additional training is needed

DIGITAL DEVELOPMENT

Continuous training, access to resources and support for pedagogical innovation must be strengthened.

PERSPECTIVES

Future research should analyse the impact of digital skills on students and barriers to ICT integration.

FUTURE WORK / REFERENCES

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